

What is claimed is:

1. A Ni/metal hydride secondary element comprising:
a negative electrode containing a hydrogen storage alloy,
an alkaline electrolyte, and
a positive electrode operably connected to the negative electrode by the electrolyte
and formed in a three-dimensional metallic conductive structure, the positive electrode
comprising an aluminum compound soluble in the electrolyte, nickel hydroxide and cobalt
oxide.
2. The Ni/metal hydride secondary element as claimed in Claim 1, wherein the
aluminum compound is in the positive electrode in an amount of about 0.1 to about 2% by
weight based on the weight of the nickel hydroxide.
3. The Ni/metal hydride secondary element as claimed in Claim 1, wherein the
aluminum compound is aluminum hydroxide and/or aluminum oxide.
4. The Ni/metal hydride secondary element as claimed in Claim 3, wherein the content
of aluminum hydroxide and/or aluminum oxide is between about 0.5 and about 1.0% by
weight based on the weight of the nickel hydroxide.

5. The Ni/metal hydride secondary element as claimed in Claim 1, wherein the positive electrode further comprises an additive selected from the group consisting of lanthanoid oxidic compounds, Y_2O_3 , La_2O_3 , $Ca(OH)_2$ and mixtures thereof.

6. The Ni/metal hydride secondary element as claimed in Claim 5, wherein the amount of oxidic compounds does not exceed about 9.0% by weight based on the weight of the nickel hydroxide.

7. A button cell formed from a Ni/metal hydride element according to Claim 1.

8. An AA battery formed from a Ni/metal hydride element according to Claim 1.

9. A Ni/metal hydride secondary element comprising:

a negative electrode containing a hydrogen storage alloy,

an alkaline electrolyte, and

a positive electrode operably connected to the negative electrode by the electrolyte and formed in a three-dimensional metallic conductive structure, the positive electrode comprising an aluminum compound soluble in the electrolyte, nickel hydroxide and cobalt oxide, and

wherein the positive electrode is substantially free of $Ca(OH)_2$ and/or Yb_2O_3 .

10. A Ni/metal hydride secondary element comprising:
a negative electrode containing a hydrogen storage alloy,
an alkaline electrolyte, and
a positive electrode operably connected to the negative electrode by the electrolyte
and formed in a three-dimensional metallic conductive structure, the positive electrode
comprising an aluminum compound soluble in the electrolyte, nickel hydroxide and cobalt
oxide, such that upon charging the element, the aluminum compound dissolves into the
electrolyte and forms a thin, porous and/or ion-conductive film of $\text{Al}(\text{OH})_3$ on surface
portions of the positive electrode.
11. The Ni/metal hydride secondary element as claimed in Claim 10, wherein the film
has a thickness of about $0.03 \mu\text{m}$ to about $0.1 \mu\text{m}$.

12. A method of forming an active positive electrode in a battery containing a negative electrode and an electrolyte comprising:

mixing an aluminum compound soluble in the electrolyte, nickel hydroxide and cobalt to form a bulk material;

forming the bulk material into a three-dimensional metallic conductive structure;

operably connecting the three-dimensional metallic conductive structure to the negative electrode by contact with the electrolyte;

causing portions of the aluminum compound to dissolve from the structure into the electrolyte by charging the battery; and

forming a thin, porous and/or ion-conductive film of $\text{Al}(\text{OH})_3$ on the surface portions, thereby activating the positive electrode.